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C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

12.24.a Setting TtB Radiation Zones - CHECKLIST

C-A-OPM Procedures in which this Attachment is used.		
12.24		

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
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Approved: _____ ***Signature on File*** _____
 Collider-Accelerator Department Chairman Date

C. Carlson

12.24.a Setting TtB Radiation Zones - Checklist

(Team Leader)_____ (Operator 2)_____

Time:_____ Date:_____

Prerequisites

- Two Operators to perform the sweep
- C-A-OPM-ATT 12.24.a – Setting TtB Radiation Zones – Checklist
- Insure that MP-7 HE Zone has been disabled.

Note 1:

The description for the search route given below is only suggested; any route that results in a completely searched and secured system is acceptable.

Note 2:

Walk from the Tandem to the end of HTB turning on all foreground lights along the way. A test of the proper setting of the zones is that the foreground lighting is extinguished when the zone is set.

Check

A. ZONE 13

- ____A1 Begin the tour at the very end of the HTB tunnel at Station K (Equipment Section 29, quadrupole magnets 29QH1 and 29QV1).
- ____A2 Look for personnel behind the bench at Station K.
- ____A3 Open the emergency exit door and check that there is nobody in the escape structure.
- ____A4 Close the exit door securely and press the inspection button located at the yellow box on the wall to the right of the door. Observe that the red LED starts to blink indicating that the inspection process has begun. An approximate two-minute time delay period has begun to allow transit to the next station.
- ____A5 Walk in a generally eastward direction, back towards the Tandem, approximately 25 feet where there is a midzone inspection station.
- ____A6 Press the inspection station button there and observe the flashing LED.
- ____A7 Proceed to the east to a point near Station J (quads 28QH1 & 28QV1) and activate the inspection station there.
- ____A8 Verify that the LED is flashing, then walk about 5 feet east and observe that the flashing LED is extinguished as the lightbeam barrier is broken.

- ____ A9 Walk 5 feet further and press the station there (at the west end of Zone 12). The LED at the last station in Zone 13 should now be lit solidly, the LED at the station just activated in Zone 12 should be blinking and the foreground lighting in Zone 13 should be extinguished.
- ____ A10 If the conditions in step A9 do not exist, go back and try to set the Zone again. Check especially that the exit door is fully closed. (If a second attempt is unsuccessful, notify the TVDG Safety Coordinator).
- ____ A11 Zone 13 is now fully set, and the sweep process has been initiated in Zone 12.

B. ZONE 12

- ____ B1 After verifying that the LED is flashing at the last inspection station near Station J, continue eastward, checking again for hidden personnel along the way.
- ____ B2 At a point 25 feet east of Station 1 (27BIP154) there is a midzone inspection station. Press the inspection station button there and observe the flashing LED.
- ____ B3 Continue eastward to a point 25 feet east of Station H (quads 27QV1 & 27QH1), the interface between zones 12 and 11.
- ____ B4 Press the easternmost zone 12 station, and observe a blinking LED.
- ____ B5 Walk eastward breaking the light barrier between the zones.
- ____ B6 Activate the station at the west end of zone 11 and observe that the last zone 12 station goes solidly lit, that the zone 12 lighting is extinguished and that the zone 11 station LED just activated is flashing.
- ____ B7 Zone 12 is now secured.

C. ZONE 11

- ____ C1 After verifying that the LED is flashing at the last inspection station near Station H, continue eastward, checking again for hidden personnel along the way.
- ____ C2 Near the 26 DH 2 dipole magnet, go up the stairs toward Bldg 941 (TtB Power Supply House #3) and check that the gate into the building is securely closed.
- ____ C3 Press the inspection station button to the left of the gate and observe the flashing LED.
- ____ C4 Go back down the stairs and continue eastward to a point 15 feet east of Station D (quads 25QV1 & 25QH1), at the interface between Zones 11 and 10.
- ____ C5 Press the easternmost Zone 11 station, and observe a blinking LED.
- ____ C6 Walk eastward breaking the light barrier between the zones.

- ____ C7 Activate the station at the west end of Zone 10 and observe that the last Zone 11 station goes solidly lit, that the Zone 11 lighting is extinguished and that the Zone 10 station LED just activated is flashing.
- ____ C8 Zone 11 is now secured.

D. ZONE 10

- ____ D1 After verifying that the LED is flashing at the last inspection station near Station D, continue eastward, checking again for hidden personnel along the way.
- ____ D2 At a point 10 feet east of Station C (24BIP155) there is a midzone inspection station. Press the inspection station button there and observe the flashing LED.
- ____ D3 Continue eastward to a point 15 feet east of Station B (quads 24QV1 & 24QH1), the interface between Zones 10 and 9. Press the easternmost Zone 10 station, and observe a blinking LED.
- ____ D4 Walk eastward breaking the light barrier between the zones.
- ____ D5 Activate the station at the west end of Zone 9 and observe that the last Zone 10 station goes solidly lit, that the Zone 10 lighting is extinguished and that the Zone 9 station LED just activated is flashing.
- ____ D6 Zone 10 is now secured.

E. ZONE 9

- ____ E1 After verifying that the LED is flashing at the last inspection station near Station B, continue eastward, checking again for hidden personnel along the way.
- ____ E2 At the 69' dipole magnet 22DS1, walk under the beamline toward the gate in the stub tunnel leading to AGS. Verify that there are no personnel in the stub tunnel, that the gate is locked and also secured with a chain and a TVDG lockout lock and red tag.
- ____ E3 Walk to the entrance gate leading to TtB Power Supply Bldg. #2 (Bldg. 908).
- ____ E4 Check that the door is securely closed and activate the inspection station to the left of the door. Again, check that the LED blinks.
- ____ E5 Continue eastward to a point 20 feet east of Station S (quads 21QV1 & 21QH1), the interface between Zones 9 and 8.
- ____ E6 Press the easternmost Zone 9 station, and observe a blinking LED.
- ____ E7 Walk eastward breaking the light barrier between the zones.
- ____ E8 Activate the station at the west end of zone 8 and observe that the last Zone 9 station goes solidly lit, that the Zone 9 lighting is extinguished and that the Zone 8 station LED just activated is flashing.

____E9 Zone 9 is now secured.

F. ZONE 8

____F1 After verifying that the LED is flashing at the last inspection station near Station S, continue eastward, checking again for hidden personnel along the way.

____F2 At a point opposite Station R (20BIP250) there is a midzone inspection station. Press the button there and observe the flashing LED.

____F3 Continue eastward to a point 25 feet east of Station Q (quads 20QV1 & 20QH1), the interface between Zones 8 and 7. Press the easternmost Zone 8 station, and observe a blinking LED.

____F4 Walk eastward breaking the light barrier between zones.

____F5 Activate the station at the west end of Zone 7 and observe that the last Zone 8 station goes solidly lit, that the Zone 8 lighting is extinguished and that the Zone 7 station LED just activated is flashing.

____F6 Zone 8 is now secured.

G. ZONE 7

____G1 After verifying that the LED is flashing at the last inspection station near Station Q, continue eastward checking again for hidden personnel along the way.

____G2 There is an emergency exit door opposite Station P (19BIP250). Open the door and check the area in the vertical staircase for personnel.

____G3 Close the door securely and press the inspection button to the left of the door and observe the flashing LED.

____G4 Continue eastward to a point 15 feet east of Station 0 (quads 19QV1 & 19QH1), the interface between zones 7 and 6. Press the easternmost Zone 7 station, and observe a blinking LED.

____G5 Walk eastward breaking the light barrier between the zones.

____G6 Activate the station at the west end of Zone 6 and observe that the last Zone 7 station goes solidly lit, that the Zone 7 lighting is extinguished and that the Zone 6 station LED just activated is flashing.

____G7 Zone 7 is now secured.

H. ZONE 6

- ____ H1 After verifying that the LED is flashing at the last inspection location near Station 0, continue eastward, checking again for hidden personnel along the way.
- ____ H2 5 feet west of Station N (18BIP153) there is a midzone inspection station. Press the inspection button there and observe the flashing LED.
- ____ H3 Continue eastward to a point 20 feet east of Station M (quads 18QV1 & 18QH1), the interface between Zones 6 and 5. Press the easternmost Zone 6 station, and observe a blinking LED.
- ____ H4 Walk eastward breaking the light barrier between the zones.
- ____ H5 Activate the station at the west end of zone 5 and observe that the last Zone 6 station goes solidly lit, that the Zone 6 lighting is extinguished and that the Zone 5 station LED just activated is flashing.
- ____ H6 Zone 6 is now secured.

I. ZONE 5

- ____ I1 After verifying that the LED is flashing at the last inspection location near Station M, continue eastward, checking again for hidden personnel along the way.
- ____ I2 At the 24' dipole magnet 17DH1, walk to the right to the entrance gate leading to TtB Power Supply Bldg. #1 (Bldg. 907). Check that the door is securely closed and activate the inspection station to the left of the door. Again, check that the LED blinks.
- ____ I3 Continue eastward to a point near Station J (quads 16QV1 & 16QH1), the interface between Zones 5 and 4. Press the easternmost Zone 5 station, and observe a blinking LED.
- ____ I4 Walk eastward breaking the light barrier between the zones.
- ____ I5 Activate the station at the west end of zone 4 and observe that the last Zone 5 station goes solidly lit, that the Zone 5 lighting is extinguished and that the Zone 4 station LED just activated is flashing.
- ____ I6 Zone 5 is now secured.

J. ZONE 4

- ____ J1 After verifying that the LED is flashing at the last inspection location near Station J, continue eastward, checking again for hidden personnel along the way.
- ____ J2 Near Station I (15BIP240) there is a midzone inspection station. Press the inspection button there and observe the flashing LED.

- ____ J3 Continue eastward to a point 15 feet east of Station H (quads 15QV1 & 15QH1) the interface between Zones 4 and 3. Press the easternmost Zone 4 station, and observe a blinking LED.
- ____ J4 Walk eastward breaking the light barrier between the zones.
- ____ J5 Activate the station at the west end of Zone 3 and observe that the last Zone 4 station goes solidly lit, that the Zone 4 lighting is extinguished and that the Zone 3 station LED just activated is flashing.
- ____ J6 Zone 4 is now secured.

K. ZONE 3

- ____ K1 After verifying that the LED is flashing at the last inspection location near Station H, continue eastward, checking again for hidden personnel along the way.
- ____ K2 70 feet east of Station G (14BIP240) there is a door leading to an emergency exit. Open the door and inspect the area beyond to verify that no personnel are present, then close the door securely and press the inspection button to the left and observe the flashing LED.
- ____ K3 Continue eastward to a point 15 feet west of Station F (quads 14QV1 & 14QH1) the interface between Zones 3 and 2. Press the easternmost Zone 3 station, and observe a blinking LED.
- ____ K4 Walk eastward breaking the light barrier between the zones.
- ____ K5 Activate the station at the west end of Zone 2 and observe that the last Zone 3 station goes solidly lit, that the Zone 3 lighting is extinguished and that the Zone 2 station LED just activated is flashing.
- ____ K6 Zone 3 is now secured.

L. ZONE 2

- ____ L1 After verifying that the LED is flashing at the last inspection station near Station F, continue eastward, checking again for hidden personnel along the way.
- ____ L2 At a point 15 feet west of Station E (13BIP240) there is a midzone inspection station. Press the inspection button there and observe the flashing LED.
- ____ L3 Continue eastward to a point 25 feet east of Station D (quads 13QV1 & 13QH1), the interface between Zones 2 and 1. Press the easternmost Zone 2 station, and observe a blinking LED.
- ____ L4 Walk eastward breaking the light barrier between the zones.
- ____ L5 Activate the station at the west end of Zone I and observe that the last Zone 2 station goes solidly lit, that the Zone 2 lighting is extinguished and that the Zone 1 station LED just activated is flashing.

____ L6 Zone 2 is now secured.

M. ZONE 1

____ M1 After verifying that the LED is flashing at the last inspection location near Station D, continue eastward, checking again for hidden personnel along the way.

____ M2 At a point 10 feet east of Station C (12 BIP 167) there is a midzone inspection station. Press the inspection button there and observe the flashing LED.

____ M3 Continue eastward to the gate 30 feet east of Station B (quads 12QV2 & 12QH2), the interface between Zone 1 and the high energy MP-7 zone. Ensure that the gate is securely closed and then press the easternmost Zone 1 button and observe a blinking LED.

____ M4 Open the gate and exit into the high energy MP-7 area, breaking the light barrier between the zones.

____ M5 Close the gate and then activate the station at the west end of the high energy MP-7 zone near the gate and observe that the last zone 1 station goes solidly lit, that the zone 1 lighting is extinguished and that the high energy MP-7 station LED just activated is flashing.

____ M6 Zone 1 is now secured.

CONCLUSION

____ 1. Press the perimeter reset button located on the jamb of the security gate to return the Tandem perimeter system to the TtB mode.

____ 2. The search and secure process for the TtB tunnel complex is now complete.

____ 3. Proceed to the TVDG control room and observe the Radiation Safety System map associated with the TtB complex. All zones should have illuminated indicators, signifying that all zones are set and in a safe condition for beam transport.

____ 4. Check the computer console to verify that the TtB beamstops at the 90' dipole magnets have been withdrawn.

____ 5. File completed checklist in appropriate binder.